



# Australian Bureau of Statistics

## 1352.0.55.042 - Research Paper: Use of ARIMA Models for Improving Revisions of X-11 Seasonal Adjustment (Methodology Advisory Committee), Nov 2001

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## Summary

### About this Release

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The Australian Bureau of Statistics (ABS) uses an enhanced version of the X-11 Variant of the Census Method II Seasonal Adjustment Program (Shiskin et. al, 1967). The X-11 method applies moving average techniques to decompose the time series into estimates for the trend, seasonal and irregular components.

A linear filter with symmetric weights (ie. a symmetric filter) has many desirable properties for seasonal adjustment. However, symmetric filters cannot be applied at the ends of a time series. The standard X-11 uses asymmetric filters to solve this problem. Asymmetric filters are often designed with assumptions about certain properties of the missing observations. ie. forecasts are implicitly applied. As a result of the forecasting, revisions will occur between the first few estimates of the seasonal factors and trend at a particular time point and the final trend estimate which is calculated using a symmetric moving average. The problem of the revisions derived from the application of asymmetric filters is often called the "end-weight" problem.

Revisions resulting from the applications of asymmetric filters are necessary to improve seasonal adjustment estimation as more data becomes available. However, revisions are undesirable and methods to minimise them are an ongoing research pursuit for the ABS. A better forecast of the missing observations can lead to a reduction in the revisions of the seasonal adjustment estimates.

Assuming the symmetric filters used in X-11 are satisfactory, the purpose of this paper is to investigate the possibility of reducing the "end-weight" problem by using X-11 with ARIMA extensions.